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Chapter 1: Overview of the Immune System

- 1. Which is the BEST definition of "immunity"?
- A) The state of having been exposed to a pathogen repeatedly
- B) The state of being resistant to reinfection with a pathogen
- C) When an individual has never been exposed to a pathogen
- D) When the immune system is activated
- E) When physical barriers are not enough to prevent infection

Answer: B

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: Vaccines can induce immunity.

Source: Test Bank Sequence: 1001

- 2. What happens to a pathogen as it becomes attenuated?
- A) It becomes more dangerous to the host.
- B) It gets smaller.
- C) It has weakened virulence.
- D) It becomes older.
- E) All of the answers are correct.

Answer: C

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

Cognitive Level: LOC

Blooms Level: Understanding

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Level of Difficulty: Moderate

Hint: Attenuated viruses are used as vaccines.

Source: Test Bank Sequence: 1002

- 3. Which of the following advances can be credited to progress made in our understanding of immunology?
- A) Smallpox eradication
- B) Treatment of asthma
- C) Ability to transplant human organs
- D) Cancer treatment
- E) All of the answers are correct.

Answer: E

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Applying Level of Difficulty: Moderate

Hint: Immunology is about more than just infectious diseases.

Source: Test Bank Sequence: 1003

- 4. Which of the following is the BEST example of herd immunity?
- A) A child infected with measles travels from Germany to the United States. Several babies contract the disease, but the outbreak is largely contained due to vaccinations.
- B) Certain populations of cattle are less susceptible to infection with encephalitis because of their genetic makeup.
- C) Once a certain threshold of individuals has been infected with a novel human pathogen, it is unlikely that any more will be.
- D) Geese and chickens are infected with different strains of influenza because they express different receptors on their cell surface.
- E) When infection spreads through a population, certain individuals generate stronger immune responses than others.

Answer: A

Question Type: Multiple Choice

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Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Applying Level of Difficulty: Moderate

Hint: The herd protects the individual.

Source: Test Bank Sequence: 1004

- 5. Which of the following diseases does NOT currently have an effective vaccine?
- A) Chicken pox
- B) Polio
- C) HIV
- D) Smallpox
- E) Diptheria

Answer: C

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: Most vaccines protect almost everyone from infection.

Source: Test Bank Sequence: 1005

6. Examine Figure 1-8. Which cells are MOST likely responsible for the intense response to Antigen A following a second exposure?

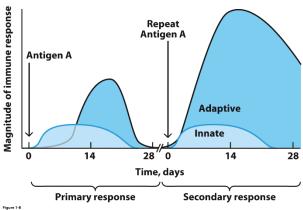


Figure 1-8 Kuby Immunology, Eighth Edition

- A) B cells
- B) T cells
- C) Memory T cells
- D) Memory B cells
- E) Both memory T cells and memory B cells are responsible.

Answer: E

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: HOC Blooms Level: Applying Level of Difficulty: Moderate

Hint: A secondary immune response is greater in magnitude when compared to a primary

response.

Source: Test Bank Sequence: 1006

- 7. Effectors of the humoral immune system are known as
- A) antibodies.
- B) immunoglobulin.
- C) complement.
- D) B cells.
- E) All of the answers are correct.

Answer: E

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

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Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: There is a cellular and a humoral component to the adaptive immune response.

Source: Test Bank Sequence: 1007

- 8. Which of the following cell types are lymphocytes?
- A) Macrophages
- B) Mast cells
- C) Neutrophils
- D) Erythrocytes
- E) T cells

Answer: E

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: Lymphocytes are involved in adaptive immunity.

Source: Test Bank Sequence: 1008

- 9. Which of the following is TRUE about antigens?
- A) They are always derived from pathogens.
- B) They are always proteins.
- C) They are recognized by T cells or B cells.
- D) They must be microbial in origin.
- E) They usually cause cellular damage.

Answer: C

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

Cognitive Level: LOC

Blooms Level: Remembering

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Level of Difficulty: Easy

Hint: There are many kinds of antigens.

Source: Test Bank Sequence: 1009

10. Two of the main, early theories proposed to explain how antigen-specific antibodies develop were the instructional theory and the selective theory. How did the two differ? Which was ultimately shown to be CORRECT?

Answer:

Feedback: The selective theory says that, when an antigen receptor binds with an antigen, the cell becomes activated (or the cell is selected to proliferate and secrete more copies of the receptor). The instructional theory says that the antigen receptor molds itself to the antigen. The selective theory was shown to be correct.

Question Type: Essay Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Evaluating Level of Difficulty: Difficult

Hint: There is a cellular and a humoral component to the adaptive immune response.

Source: Test Bank Sequence: 1010

11. Often, serendipity plays a role in significant scientific discoveries. In your own words, explain how serendipity led Pasteur to discover a cholera vaccine.

Answer:

Feedback: Pasteur developed the vaccine in chickens, which were in short supply. He challenged groups of chickens with cholera bacteria — some of which were previously exposed to an attenuated version of cholera bacteria. Only the previously exposed animals were protected from a new challenge, which led to the use of weakened pathogens as vaccines.

Question Type: Essay Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Evaluating Level of Difficulty: Difficult

Hint: Serendipity is luck that takes the form of finding valuable knowledge unintentionally.

Source: Test Bank

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Sequence: 1011

12. Despite its having been eradicated on a global scale, smallpox is presently considered a potential bioterrorism threat. Why? Use evidence to support your answer.

Answer:

Feedback: After eradication was achieved, smallpox vaccination programs largely ended. As populations continued to grow over time, an ever-increasing percentage of the human population remains unvaccinated and thus, is still susceptible to the disease.

Question Type: Essay Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Moderate

Hint: Smallpox immunity is not inherited.

Source: Test Bank Sequence: 1012

13. Prior to 1999, it was claimed that a thimerosal additive in vaccines was contributing to the rising incidence of autism. If the claims were true, what resultant trend might you expect to observe in the rate of autism once thimerosal was removed from vaccines?

Answer:

Feedback: One would reasonably expect a decrease in the rate of autism. However, cases of autism continued to rise after thimerosal was removed from vaccines in 2001.

Question Type: Essay Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Moderate

Hint: Consider the scientific method in establishing correlations.

Source: Test Bank Sequence: 1013 14. Given the discovery and development of effective antibiotics, make an argument for the continued use of vaccines against bacterial pathogens. Use evidence to support your answer.

Answer:

Feedback: Antibiotics are used for treatment of disease, not typically for prevention. Antibiotic treatment is not foolproof (considering the rising incidence of antibiotic resistance). Vaccines are a preventative measure, and prevention is the gold standard for infectious disease control measures.

Question Type: Essay Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Evaluating Level of Difficulty: Difficult

Hint: Consider treatment versus prevention.

Source: Test Bank Sequence: 1014

15. You have a friend unfamiliar with immunology, and he asks you the following question: "Why do I need the flu shot every year, but don't need an annual chickenpox vaccine?" As a student of immunology, how would you explain this discrepancy to your friend? Use evidence to support your answer.

Answer:

Feedback: The virus that causes the flu changes every year — as a result, a new flu vaccine must be prepared each year based on a predication of the most common forms of the virus likely to be encountered. Vaccines are specific in the type of pathogen against which they protect, and protection against one type does not guarantee protection against pathogens that are closely-related.

Question Type: Essay Chapter Name: 1 Section: 1.1

Cognitive Level: HOC Blooms Level: Evaluating Level of Difficulty: Difficult

Hint: A number of viral pathogens are genetically variable.

Source: Test Bank Sequence: 1015

16. Which of the following is a fungal pathogen?

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- A) Vibrio cholera
- B) Leishmania major
- C) Poliovirus
- D) Candida albicans
- E) Bordetella pertussis

Answer: D

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy Hint: Yeasts are fungi. Source: Test Bank Sequence: 1016

- 17. True or False? Overall, the human immune system views microbes as pathogens.
- A) True
- B) False

Answer: B

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Difficult

Hint: Consider the concept of the microbiome.

Source: Test Bank Sequence: 1017

- 18. Which of the following factors has been shown as potentially impacting immune homeostasis in favor of inflammation?
- A) Diet
- B) Stress
- C) Microbiome composition

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- D) All of the answers are correct.
- E) None of the answers are correct.

Answer: D

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: HOC Blooms Level: Applying Level of Difficulty: Moderate

Hint: Immune imbalance can lead to uncontrolled inflammation.

Source: Test Bank Sequence: 1018

- 19. Many of the ideas raised by Ehrlich's conception of selective theory were true. Which of the following ideas (if any) were later shown to be FALSE?
- A) Interaction between a cell-bound receptor and pathogen could induce the cell to proliferate.
- B) The specificity of receptors was determined in the host prior to exposure to a foreign antigen.
- C) The antigen selected the appropriate receptor in a specific manner.
- D) The binding of a receptor to an infectious agent was like the fit between a lock and a key.
- E) All the ideas listed were shown to be true.

Answer: E

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Difficult

Hint: A high degree of specificity exists in the immune system.

Source: Test Bank Sequence: 1019

20. Provide one benefit and one drawback of generating random recognition receptors during the development of B cells.

Answer:

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Feedback: A benefit is having the capacity to recognize and respond to diverse pathogens as they evolve. A drawback is that some recognition receptors could potentially recognize and target

host antigens.

Question Type: Essay Chapter Name: 1 Section: 1.2

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Moderate

Hint: Consider the causes of autoimmune disorders.

Source: Test Bank Sequence: 1020

21. A portion of our immune systems' white blood cells is constantly circulating throughout the body via circulation and lymphatics. What is the benefit of such circulation?

Answer:

Feedback: The circulation of the white blood cells allows for a more comprehensive surveillance of the body for the presence of potential pathogens. A significant portion of the human body is constantly exposed to potential microbial pathogens.

Question Type: Essay Chapter Name: 1 Section: 1.2

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Moderate

Hint: A primary function of the immune system is to detect pathogens.

Source: Test Bank Sequence: 1021

- 22. Which of the following cell types is MOST commonly associated with recognizing antigens found inside of cells?
- A) Macrophages
- B) B cells
- C) T_H cells
- D) CTLs
- E) Antibodies

Answer: D

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Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: Viruses are found inside of cells.

Source: Test Bank Sequence: 1022

- 23. Which of the following classes of cell surface receptors are directly encoded in the germ line?
- A) TCR
- B) BCR
- C) PRR
- D) Antibodies
- E) All of the answers are correct.

Answer: C

Question Type: Multiple Choice

Chapter Name: 1 Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Section: 1.2

Hint: Some receptors are randomly generated rather than encoded in the germ line.

Source: Test Bank Sequence: 1023

- 24. What is the central mechanism for establishing self-tolerance?
- A) Self-reactive T cells and B cells are killed during development.
- B) Individuals that have immune systems that respond to self-antigens do not survive to reproduce.
- C) Immune cells that react to self-antigens are turned off when they recognize self-tissues.
- D) Certain immune suppressive cytokines are maintained in tissues to dampen auto reactive immune responses.
- E) Peripheral tissues have mechanisms to kill T or B cells that respond to them.

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Answer: A

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: Central tolerance develops as cells are maturing.

Source: Test Bank Sequence: 1024

25. Complete the following table by comparing and contrasting innate and adaptive immune responses.

	Innate Immunity	Adaptive Immunity
Is mediated by what cells?		
What do they recognize?		
How are the receptors encoded?		
Why can't they control all infections alone?		
What do they do in response to antigen?		

Answer:

Feedback:

	Innate Immunity	Adaptive Immunity
Is mediated by what cells?	Macrophages, NK cells, neutrophils, mast cells eosinophils	T cells and B cells
What do they recognize?	Pathogen patterns	Specific epitopes
How are the receptors encoded?	Germ line	Rearranged gene segments
Why can't they control all infections alone?	Pathogens evolve escape mechanisms	Takes too long to develop

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What do they do in	Engulf and	Produce antibodies,
response to antigen?	destroy, induce	kill infected cells
	inflammation	

Question Type: Essay Chapter Name: 1 Section: 1.2

Cognitive Level: HOC Blooms Level: Evaluating Level of Difficulty: Difficult Hint: Review Table 1-4.

Source: Test Bank Sequence: 1025

26. What are the hallmarks of inflammation? Describe the physical characteristics of someone experiencing an inflammatory response.

Answer:

Feedback: Redness, swelling, heat, pain. Someone experiencing inflammation might have localized swelling and redness or itching or may be experiencing faintness due to a lowering of blood pressure if more severe.

Question Type: Essay Chapter Name: 1

Section: 1.2

Cognitive Level: LOC Blooms Level: Applying Level of Difficulty: Moderate

Hint: Many people experience inflammation in response to an insect bite.

Source: Test Bank Sequence: 1026

27. Upon receiving immune serum as a treatment for a venomous snake bite, would the recipient be immune from future bites of the same species?

Answer:

Feedback: In the short-term, probably, as the serum contains protective antibodies against the venom. In the long-term, no, as serum treatment is a form of passive immunity. Passive immunity does not generate long-lived memory cells.

Question Type: Essay Chapter Name: 1 Section: 1.2

Cognitive Level: HOC

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Blooms Level: Analyzing Level of Difficulty: Moderate

Hint: Memory cell generation is needed for long-existing immunity.

Source: Test Bank Sequence: 1027

28. Provide one common feature of and two differences between B-cell receptors and PRRs.

Answer:

Feedback: A common feature is that they both are used to recognize foreign antigens. A B-cell receptor is more selective than a PRR. The DNA that encodes for a PRR in an individual is inherited. The DNA that encodes for a mature B-cell receptor from an individual is not passed on to offspring.

Question Type: Essay Chapter Name: 1

Section: 1.2

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Moderate

Hint: Generation of diversity is employed by developing B cells.

Source: Test Bank Sequence: 1028

- 29. Which of the following BEST describes chemokines?
- A) Membrane receptors that detect the presence of soluble messengers in the environment
- B) Soluble proteins that recruit specific cells to an area
- C) Chemical messengers that induce cell differentiation
- D) Transcription factors that induce the expression of genes involved in cell adhesion
- E) Adhesion molecules that bind to the inside of blood vessels

Answer: B

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: LOC

Blooms Level: Understanding Level of Difficulty: Moderate

Hint: Chemokines are a specific kind of cytokine.

Source: Test Bank

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Sequence: 1029

- 30. Which of the following statements BEST differentiates innate and adaptive immune responses?
- A) Innate responses are stronger during the primary and less important during the secondary response, whereas adaptive responses are less robust during primary responses and stronger during secondary responses.
- B) Innate responses are weaker during the primary and more robust during the secondary response, whereas adaptive responses are stronger during the primary and weaker during secondary responses.
- C) Innate responses are slower and weaker than adaptive responses.
- D) Adaptive responses are slower and weaker than innate responses.
- E) Adaptive responses are required for effective immune responses, whereas innate responses are not required.

Answer: A

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: LOC

Blooms Level: Understanding Level of Difficulty: Moderate

Hint: Innate and adaptive responses are intertwined.

Source: Test Bank Sequence: 1030

- 31. True or False? The innate and adaptive immune responses work largely independently of one another.
- A) True
- B) False

Answer: B

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: LOC

Blooms Leve: Understanding Level of Difficulty: Moderate

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Hint: How are adaptive responses initiated?

Source: Test Bank Sequence: 1031

32. How do memory cells develop?

- A) Upon reinfection, memory centers in the brain send signals to the bone marrow to induce T-cell and B-cell differentiation.
- B) T cells and B cells from the primary response persist and become reactivated.
- C) Innate cells are trained to activate new T cells and B cells more quickly with secondary infection.
- D) T cells and B cells from the primary infection slowly mutate their receptors over time, priming themselves for the secondary response.
- E) Innate cells modify their cell surface receptors to prepare for reinfection.

Answer: B

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.2

Cognitive Level: LOC

Blooms Level: Understanding Level of Difficulty: Moderate

Hint: Memory cells are derived from effector cells.

Source: Test Bank Sequence: 1032

- 33. Which of the following is the BEST example of a hypersensitivity reaction?
- A) T cells responding vigorously to the flu virus
- B) B cells failing to respond to HIV, allowing it to replicate out of control
- C) Inflammation of the airways in response to pollen
- D) Anemia as a result of iron deficiency
- E) T cells attacking the myelin sheath of nerves resulting in paralysis

Answer: C

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.3

Cognitive Level: LOC

Blooms Level: Understanding

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Level of Difficulty: Moderate

Hint: Hypersensitivity reactions occur in response to common, benign antigens.

Source: Test Bank Sequence: 1033

34. Given that an important function of the immune system is to both recognize and dispose of cancerous cells, postulate why tumors can be established in a human host.

Answer:

Feedback: There are two primary reasons. First, cancerous cells are self-originating, thus self-tolerance mechanisms can inhibit the development of an effective immune response. Second, as is common with some pathogens, genetic variability within a population of cancer cells gives them an advantage in terms of evading the immune response.

Chapter Name: 1 Section: 1.3

Question Type: Essay Cognitive Level: HOC Blooms Level: Evaluating Level of Difficulty: Difficult

Hint: Cancerous cells, although different from noncancerous cells, are still human cells.

Source: Test Bank Sequence: 1034

35. The hygiene hypothesis posits that there is a connection between environmental conditions and certain inappropriate immune responses. If you were a supporter of the hygiene hypothesis, what recommendations would you make to keep people healthier?

Answer:

Feedback: Expose children to more common antigens found in dirt and in the outdoors. Reduce use of antimicrobials.

Question Type: Essay Chapter Name: 1 Section: 1.3

Cognitive Level: HOC Blooms Level: Evaluating Level of Difficulty: Difficult

Hint: This hypothesis suggests that hygienic conditions have caused immune responses to

become skewed toward allergy.

Source: Test Bank Sequence: 1035

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36. HIV disease is a(an)

- A) autoimmune disease.
- B) hypersensitivity disease.
- C) immunodeficiency.
- D) genetic disorder.
- E) allergic reaction.

Answer: C

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.3

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: People with HIV disease get sick more often than usual.

Source: Test Bank Sequence: 1036

- 37. Predict the outcome of being immunosuppressed as it relates to the development of cancer.
- A) Immunosuppressed individuals are at lower risk of cancer because cytokines produced by the immune system induce cancer.
- B) Immunosuppressed individuals are at lower risk of cancer because they are more likely to contract infectious diseases.
- C) Immunosuppressed individuals are at higher risk of cancer because the immune system recognizes and destroys cancerous cells.
- D) Immunosuppressed individuals are at higher risk of cancer because they bear a higher load of microbes that damage host tissues.
- E) None of the answers are correct.

Answer: C

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.3

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Difficult

Hint: T cells can recognize modified host proteins.

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Source: Test Bank Sequence: 1037

- 38. What occurs when someone receives a tissue transplant from an unrelated individual?
- A) The host's lymphocytes enter the tissues and become suppressed.
- B) The host's lymphocytes enter the tissues and become activated.
- C) The host's lymphocytes that react to the tissue graft are deleted in the thymus.
- D) The donor's lymphocytes suppress the host's lymphocytes, allowing for graft survival.
- E) The donor's lymphocytes destroy the host's immune system.

Answer: B

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.3

Cognitive Level: HOC Blooms Level: Analyzing Level of Difficulty: Difficult

Hint: People receiving transplants are often put on immunosuppressive drugs.

Source: Test Bank Sequence: 1038

- 39. Which of the following is TRUE?
- A) Vaccines cause autism.
- B) Vaccines cause obesity.
- C) Vaccines cause cancer.
- D) Vaccines cause diabetes.
- E) None of the answers are correct.

Answer: E

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.1

Cognitive Level: LOC

Blooms Level: Remembering Level of Difficulty: Easy

Hint: The Lancet article was retracted.

Source: Test Bank Sequence: 1039

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- 40. Conditions in which the immune system attacks self-antigens are known as
- A) autoimmunity.
- B) immune deficiency.
- C) hypersensitivities.
- D) neuroplasias.
- E) None of the answers are correct.

Answer: A

Question Type: Multiple Choice

Chapter Name: 1 Section: 1.3

Cognitive Level: LOC

Blooms Level: Understanding Level of Difficulty: Moderate

Hint: People with HIV disease get sick more often than usual.

Source: Test Bank Sequence: 1040